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PHOTOPHYSICAL PROPERTIES OF TUNGSTEN-ALKYLIDINE COMPOUNDS.

Vivian E. Ferry, Jibin Sun, Michael D. Hopkins*, University of Chicago, Department of Chemistry, Chicago IL 60637, mhopkins@uchicago.edu.

Conjugated molecules with tunable photophysical and optical properties have potential applications in small-scale electronics. Here we report an investigation of the photophysical properties of a series of tungsten-alkylidyne compounds of the general type C_6H_6-$\{CWL_4Cl\}_n$ (L=phosphine, n = 1,2). The complexes were studied using absorption, emission, and excitation spectroscopy. The complexes exhibit photoluminescence in fluid solution at room temperature. Emission quantum yield and lifetime measurements were recorded. Low temperature and solid state emission studies were also performed to study the underlying structure of the transitions. From this data, the rates of radiative and non-radiative decay were calculated. The rate of radiative decay for the fully symmetrical dinuclear molecule was smaller by an order of magnitude than either the unsymmetrical dinuclear compound or the monomer.